

## TAG 2.4 Explore

Name \_\_\_\_\_  
Hour \_\_\_\_\_ Date \_\_\_\_\_



### How Does a Propeller Motor Cause Your Car to Move?

Read the top of pg. 115. What will you be exploring in this section?

#### Conference

Read the bottom of pg. 115 and answer the following with your group.

Where are the forces coming from that make your propeller car move?

What is pushing against the car or pulling it?

How is the push created?



#### Communicate

Follow your teacher's directions to share your ideas.

### Forces Always Come in Pairs pg. 116-117

Explain the difference between action force and reaction force. Give an example of each.

Action Force	Reaction Force
Example:	Example:

Why is reaction force not a precise name?

When your coaster car is sitting on the floor, what is the action force? reaction force?

### Contact & Non-Contact Forces pg. 117

What is the difference between a contact force and a non-contact force? Give an example of each.

Contact Force:	Non-Contact Force:
Example:	Example:

## Procedure pgs. 118-121

Read and follow the procedures for the 3 investigations. Record your data and predictions on the *Forces in Pairs Investigations* sheet.

What instrument is used to measure force?

What unit is used when measuring forces?

Write the abbreviation:



**Analyze Your Data:** Read pg. 121. Answer the following questions with your group.

1. During the first activity, what happened to the reading on the spring scale as mass increased?
2. Compare your predictions with what happened in the second activity. How well did you predict what would happen?
3. During the second activity, the two scales were bottom to bottom and someone was pulling each scale. What was interesting about the readings on both scales? How did they change? Why did this happen?
4. Compare your predictions with what happened in the third activity. How well did you predict what would happen?
5. During the third activity, the scales were exposed to gravity in different ways. What was interesting about the readings on the scales during this activity? Why did this happen?
6. If a scale reads that you are pulling with 20 N of force, with how much force is the scale pulling back on your hand?
7. Draw a force diagram for each scale in each of the activities you participated in.

8. Write a statement that describes the forces generated when two objects interact. Think about how the forces compare in size and direction.

**Reflect:** Read the top of pg. 122 and follow the directions on the *Forces in Pairs* page.

**Forces in Pairs and Motion:** Read pgs. 122-124.

How can action-reaction forces change the motion of an object?



Explain how this works when you kick a soccer ball. Draw a diagram showing the forces to help your explanation.

Give 2 other examples of action-reaction forces and explain each.

1.

2.

**Mass, Gravity, and Weight:** Read pgs. 125-126.

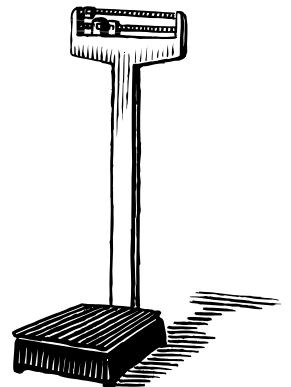
What is the difference between mass and weight?

What is gravity? How does it affect all mass in the universe?

The force of gravity between 2 objects depends on what 2 things?

1.

2.



\*The more matter or mass, the \_\_\_\_\_ the gravitational pull.

\*The closer objects are to each other, the \_\_\_\_\_ the gravitational pull.

Why don't you notice the pull between you and the other objects on Earth?

Write the equation to show the relationship between the force of gravity, the mass of two objects, and the distance the objects are from each other. Include a diagram.



**Reflect:** Read the questions on the top of pg. 127 and discuss with your group. Record your answers below and be ready to share with the class.

1.

2.

**The Propulsion Force from Your Propeller Motor:** Read the bottom of pg. 127.

**Reflect:** pg. 128

1. Describe the forces that cause your propeller car to accelerate. Support your description with diagrams.

2. Identify the force pairs acting on your propeller car when it is in motion.

3. You used spring scales to measure the forces being applied by people. Suppose you wanted to measure the force of your propeller motor. Why is a spring scale a poor choice of measuring instrument for that?
  
4. How do you think you could measure the force of propulsion acting on a propeller car? Draw a diagram to show where you would place the car and where you would place the spring scale.

**Revise Your Recommendations:** Read the top of pg. 130 and with your group, revise your recommendations from the last section.



**What's the Point?:** pg. 130

Write 4 main ideas from this section.

1.

2.

3.

4.